

WHAT IS CLAIMED IS:

1. A method for assessing irradiation intensity of a laser beam including steps of:

irradiating the laser beam onto a reference object on which a change in its state is caused by irradiating the laser beam, and a light quantity of transmitted light of specified illumination light changes in accordance with an irradiation energy density of the laser beam when the illumination light is projected;

obtaining an image formed by a change in the light quantity of the transmitted light, occurring when the illumination light is projected on the reference object having been irradiated by the laser beam; and

analyzing a condition of the change in the reference object based on the obtained image, wherein an irradiation intensity distribution of the laser beam is assessed based on an analytical result.

2. The method for assessing irradiation intensity of the laser beam according to claim 1, wherein the irradiation step includes a step of irradiating the laser beam on the reference object on which ablation is caused by irradiating the laser beam, and on which the light quantity of the transmitted light of the illumination light changes in accordance with an ablation depth, and

wherein the analyzing step includes a step of analyzing the ablation depth of the reference object based on the image obtained in the image obtaining step.

3. The method for assessing irradiation intensity of the laser beam according to claim 1, wherein the irradiation step includes a step of irradiating the laser beam so that plural irradiation samples are created on the reference object in different irradiation conditions, and

wherein the analyzing step includes a step of obtaining information on luminance inclination of each of the samples base on luminance distribution data of the image obtained in the image obtaining step, and of analyzing the condition of the change in the reference object based on a relationship between the obtained information on the luminance inclination and the irradiation condition at the time of creating each of the irradiation samples.

4. An apparatus for assessing irradiation intensity of a laser beam comprising:

a reference object on which a change in its state is caused by irradiating the laser beam, and a light quantity of transmitted light of specified illumination light changes in accordance with an irradiation energy density of the laser beam when the illumination light is projected;

an image obtaining device which obtains an image formed by a change in the light quantity of the transmitted light, occurring when the illumination light is projected on the reference object having been

irradiated by the laser beam; and

an analyzing device which analyzes a condition of the change in the reference object based on the obtained image, wherein an irradiation intensity distribution of the laser beam is assessed based on an analytical result.

5. The apparatus for assessing irradiation intensity of a laser beam according to claim 4, wherein the reference object includes an ablation reference object on which ablation is caused by irradiating the laser beam, and on which the light quantity of the transmitted light of the illumination light changes in accordance with an ablation depth, and

wherein the analyzing device analyzes the ablation depth of the reference object based on the image obtained by the image obtaining device.

6. The apparatus for assessing irradiation intensity of a laser beam according to claim 4, wherein the image obtaining device obtains the image of the reference object on which plural irradiation samples are created by irradiating the laser beam in different irradiation conditions, and

wherein the analyzing device obtains information on luminance inclination of each of the samples base on luminance distribution data of the obtained image and analyzes the condition of the change in the reference object based on a relationship between the obtained information on the luminance inclination and the

irradiation condition at the time of creating each of the irradiation samples.

7. The apparatus for assessing irradiation intensity of a laser beam according to claim 4, wherein the reference object includes a film for photographing.

8. A laser beam irradiation system comprising:  
an irradiation optical system for irradiating a laser beam onto an object to be irradiated;

a reference object on which a change in its state is caused by irradiating the laser beam, and a light quantity of transmitted light of specified illumination light changes in accordance with an irradiation energy density of the laser beam when the illumination light is projected;

an image obtaining device which obtains an image formed by a change in the light quantity of the transmitted light, occurring when the illumination light is projected on the reference object having been irradiated by the laser beam;

an analyzing device which analyzes a condition of the change in the reference object based on the obtained image; and

a control device which obtains control data for the system so that the object to be irradiated achieves a condition of a desired change based on an analytical result from the analyzing device.

9. The laser beam irradiation system according to

claim 8, further comprising a laser scanning unit which is arranged in the irradiation optical system and scans the object to be irradiated by the laser beam, and

wherein the control device obtains the control data for the laser scanning unit.

10. The laser beam irradiation system according to claim 8, wherein the laser beam includes a laser beam ablating the object to be irradiated,

wherein the reference object includes an ablation reference object on which ablation is caused by irradiating the laser beam, and on which the light quantity of the transmitted light of the illumination light changes in accordance with an ablation depth, and

wherein the analyzing device analyzes the ablation depth of the reference object based on the image obtained by the image obtaining device.

11. The laser beam irradiation system according to claim 8, wherein the image obtaining device obtains the image of the reference object on which plural irradiation samples are created by irradiating the laser beam in different irradiation conditions, and

Wherein the analyzing device obtains information on luminance inclination of each of the samples based on luminance distribution data of the obtained image and analyzes the condition of the change in the reference object based on a relationship between the obtained information on the luminance inclination and the

irradiation condition at the time of creating each of the irradiation samples.

12. The laser beam irradiation system according to claim 8, wherein the reference object includes a film for photographing.